

Resource Estimates & Reserves

◆ Background

- ✓ To better assess and estimate the undiscovered natural gas and oil, the MMS Resource Evaluation Program adopted a new methodology based upon an analysis of geologic plays in the various offshore provinces. The new methodology shows significantly higher estimates for both natural gas and oil (chiefly in the Beaufort and Chukchi Sea areas of Alaska). However, MMS cautions that comparisons with past estimates are difficult because of extensive modeling and general assessment methodology changes.
- ✓ In the Gulf of Mexico Region, reserve estimates are derived from geologic mapping completed on some 905 proved fields and 51 unproved fields.
- ✓ In the Pacific Region, reserve estimates are derived from geologic mapping completed on all (13) proved fields. In addition, some 25 unproved fields are being geologically mapped and economically evaluated.
- ✓ In the Alaska OCS Region, while there are no commercial fields, numerous studies have been conducted associated with such prospects as Liberty, Northstar, and Kuvlum.

◆ OCS Resource Mean Estimates

- ✓ *Conventionally recoverable resource estimates* indicate the amount of resources expected to be present and could be developed using conventionally available technology. *Economically recoverable resource estimates* indicate the portion of the undiscovered conventionally recoverable resources that can be produced commercially at a given cost or price using present technology. The tables below show mean estimates for undiscovered *conventionally* recoverable OCS resources and undiscovered *economically* recoverable OCS resources for each region.

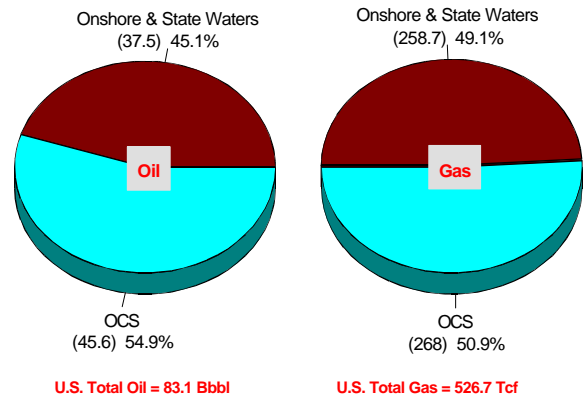
Undiscovered Conventionally Recoverable OCS Resources Mean Estimates		
Region	Oil (Bbbbl)	Natural Gas (Tcf)
▪ Alaska · · · · ·	24.3	125.9
▪ Atlantic · · · · ·	2.3	27.5
▪ Gulf of Mexico · ·	8.3	95.7
▪ Pacific · · · · ·	10.7	18.9
Total	45.6	268.0

Undiscovered Economically Recoverable OCS Resources Mean Estimates		
Region	Oil (Bbbbl)	Natural Gas (Tcf)
▪ Alaska · · · · ·	3.8	1.1
▪ Atlantic · · · · ·	0.4	5.2
▪ Gulf of Mexico · ·	4.9	57.9
▪ Pacific · · · · ·	5.3	8.3
Total	14.4	72.5

✓ Estimates of undiscovered conventionally recoverable resources of the OCS (made by MMS) and of onshore and state water resources (made by the U.S. Geological Survey) show that about 55 percent of the Nation's conventionally recoverable oil resources and 51 percent of the Nation's conventionally recoverable gas resources are in the OCS.

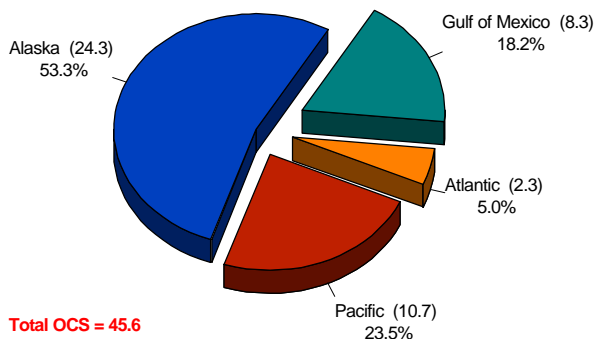
✓ The charts below show estimates for those undiscovered OCS oil and gas resources that are conventionally recoverable and for those that are economically recoverable.

Undiscovered Conventionally Recoverable OCS Oil & Gas Resources: 1995



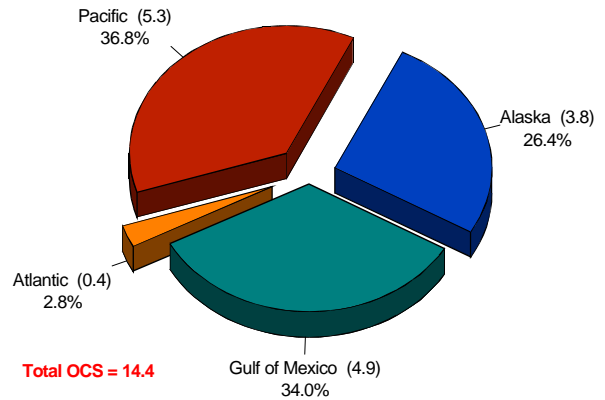
Undiscovered Conventionally Recoverable OCS Oil Resources: 1995

[In billion barrels]



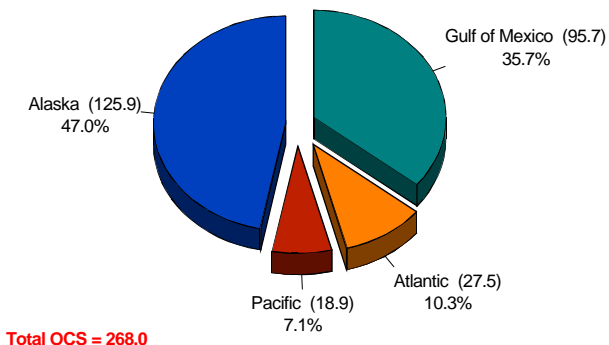
Undiscovered Economically Recoverable OCS Oil Resources: 1995

[In billion barrels]



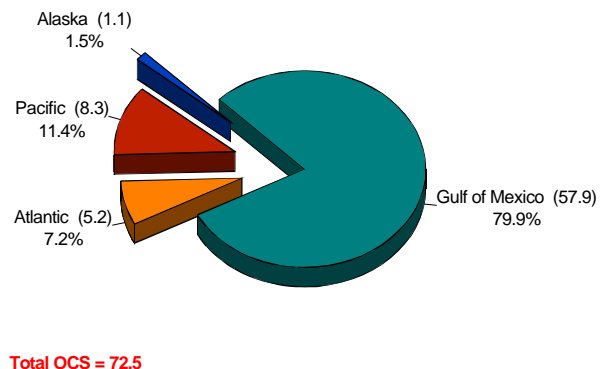
Undiscovered Conventionally Recoverable OCS Gas Resources: 1995

[In trillion cubic feet]



Undiscovered Economically Recoverable OCS Gas Resources: 1995

[In trillion cubic feet]



◆ Projections for Future Production

- ✓ In the President's 1998 budget, projected production for oil is 0.51 Bbbl for the year. The projected production for gas is 4.9 Tcf for the year.
- ✓ Royalty production and royalty rates estimates are based on an OMB oil price per barrel ranging from \$21.56 in FY97 to \$25.53 in FY2007 and a gas price per million cubic feet ranging from \$2.26 in 1997 to \$2.92 in FY2007.

President's 1998 Budget Production Projections												
Fiscal Years	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Oil												
Production (million barrels):												
▪ Alaska	0	0	0	2	2	2	2	1	1	1	1	*0
▪ Pacific	71	72	71	69	66	63	60	60	60	58	56	54
▪ Gulf of Mexico	362	413	450	480	574	610	629	647	665	683	702	720
▪ Gulf of Mexico Royalty Production**	362	411	440	460	541	566	573	568	526	487	454	424
Total Royalty Production	433	483	511	531	609	631	635	629	587	546	511	478
Royalty Rate	0.1519	0.1491	0.1460	0.1429	0.1400	0.1379	0.1375	0.1364	0.1358	0.1351	0.1345	0.1338
OMB Price/Barrel	16.86	21.56	20.29	20.82	21.36	21.91	22.48	23.06	23.60	24.26	24.88	25.53
Royalty Receipts (millions of dollars)	1,108.9	1,552.7	1,513.8	1,821.2	1,821.2	1,906.5	1,962.8	1,978.4	1,881.3	1,789.5	1,710.0	1,632.8
Gas												
Production (billion cubic feet):												
▪ Pacific	45	54	53	52	50	47	45	45	45	44	42	41
▪ Gulf of Mexico	4,726	4,999	4,884	4,905	4,675	4,385	4,398	4,471	4,544	4,617	4,690	4,763
▪ Gulf of Mexico Royalty Production**	4,726	4,994	4,851	4,818	4,511	4,076	3,743	3,393	3,082	2,834	2,618	2,451
Total Royalty Production	4,771	5,048	4,904	4,870	4,561	4,123	3,788	3,438	3,127	2,878	2,660	2,492
Royalty Rate	0.1640	0.1592	0.1579	0.1573	0.1556	0.1529	0.1491	0.1470	0.1452	0.1435	0.1417	0.1402
OMB Price per Mcf.	2.22	2.26	2.32	2.38	2.44	2.50	2.57	2.64	2.70	2.78	2.85	2.92
Royalty Receipts (millions of dollars)	1,740.7	1,816.2	1,796.5	1,823.2	1,731.8	1,576.0	1,451.5	1,334.2	1,225.9	1,148.1	1,074.2	1,020.2
* Based on estimates from Cook Inlet only.												
**Consists of GOM production net of that production which is not subject to royalties because of the Deep Water Royalty Relief Act.												

◆ Proved Reserves in the Gulf of Mexico and Pacific OCS

- ✓ Proved reserves are estimated with reasonable certainty to be recovered under current economic conditions. Current economic conditions include prices and costs prevailing at the time of the estimate. Proved reserves must either have facilities that are operational to process and transport those reserves to market at the time of the estimate or a commitment or reasonable expectation to install such facilities in the future.
- ✓ Proved reserves totals (as of December 31, 1995) for the Gulf of Mexico are 2.33 billion barrels (Bbbl) of oil and 27.5 trillion cubic feet (Tcf) of gas; for the Pacific OCS, 0.66 Bbbl of oil and 1.66 Tcf of gas.

◆ Original and Remaining Reserves, Gulf of Mexico and Pacific OCS

- ✓ Original reserves are considered to be the amount of oil and gas expected to be recovered from the original oil and gas in place or the amount equal to the sum of the cumulative production and remaining reserves.
- ✓ As of December 31, 1995, original proved reserves for the Gulf of Mexico were estimated to be 12.01 Bbbl of oil and 144.9 Tcf of gas. Remaining proved and unproved reserves were estimated to be 3.53 Bbbl of oil and 31.6 Tcf of gas.
- ✓ As of December 31, 1995, original proved reserves for the Pacific were estimated to be 1.41 Bbbl of oil and 2.36 Tcf of gas. Remaining proved and unproved reserves were estimated to be 1.31 Bbbl of oil and 2.43 Tcf of gas.

◆ Historical Price Information (Natural Gas and Oil)

- ✓ In 1995, the annual average price of domestic crude oil purchased at the wellhead was \$14.62. By the end of November 1996, the average price was \$18.20/bbl. (Source: EIA, Feb. 1997)
- ✓ In 1995, the annual average wellhead price of natural gas was \$1.55/Tcf. At the end of October 1996, the price increased to \$2.09/Tcf. (Source: EIA, Feb. 1997)
- ✓ In 1981, the highest average annual price of domestic crude was \$31.77/bbl. (Source: EIA, Dec. 1996)
- ✓ In 1984, the highest average annual price of natural gas was \$2.66/Tcf. (Source: EIA, Dec. 1996)